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The effectiveness of international organisations in the fight against HIV/AIDS

BA thesis

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Abstract

HIV/AIDS virus is spreading and the way to stop it is to do so through different policy and legal implementations. The aim of this thesis is to analyse how ART and international finances affect the number of people living with HIV by constructing a correlation matrix and regression model. To better analyse how different indicators might be affected theoretical overview was given both on medical and political factors. In this thesis three hypotheses were formed. Due to the lack of data the first hypotheses (prediction model) was rejected and the second hypotheses (descriptive model) was used. The results showed that when a number of people living with HIV raises the number of people receiving ART and international finances increase. The deduction could be made that implemented policies are effective. It is important to note that increasing numbers of HIV cases occurred mostly in lower income countries. By analysing political strategies of countries it was seen that there was a lack of implementation of human rights even though collective rights were mostly covered. As most national government guidelines only included ART, HIV testing and counselling. Meaning that due to the lack of implementation of human rights, stigma, fear and discrimination amongst key populations are still occurring resulting in a number of people not getting tested for HIV. Further research concerning how political implementations directly affect the number of people living with HIV is needed in order to fully understand the problem and to find the best solution.

Table of Contents

Abbreviations

WHO	World Health Organization
UNData	United Nations Database
NGOs	Non-governmental organizations
TB	Tuberculosis
FDA	Food and Drug Administration
U.S.	United States
UNAIDS	Joint United Nations Programme on HIV/AIDS
HIV	Human immunodeficiency virus
AIDS	Acquired immunodeficiency syndrome
OIs	Opportunistic infections
CDC	Centres for Disease Control and Prevention
IAPAC	International Association of Providers of AIDS Care
PEPFAR	The U.S President's Emergency Plan for AIDS Relief
ART	Antiretroviral therapy
AMC	Adult male circumcision
NRTIs	Nucleoside/Nucleotide Reverse Transcriptase Inhibitors
NNRTIs	Nonnucleoside Reverse Transcriptase Inhibitors
PIs	Protease Inhibitors
UN	United Nations
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
US FDA	US Food and Drug Administration
ARV	Antiretroviral
FDC	Fixed-dose combination
GHIs	Global health initiatives
MSM	Men who have sex with men
STIs	Sexually transmitted infections
PEP	Post-exposure prophylaxis
PrEP	Pre-exposure prophylaxis
BRICS	Brazil, Russia, India, China and South Africa
PMTCT	Prevention of mother-to-child transmission

CHAI	Clinton Health Access Initiative
VPP	Voluntary Pooled Procurement
VIF	Variance inflation factor

1. Introduction

According to WHO (World Health Organisation) (2017) at the end of 2016, there were 36.7 million people living with HIV (Human immunodeficiency virus) and 1.8 million people becoming newly infected every year. HIV and AIDS (Acquired immunodeficiency syndrome) cause depletion and eventual exhaustion of immune responses. HIV often develops into AIDS and in 10 to 15 years or more leads to severe disease and death. Since it damages the immune system, there are more infections by microorganisms that would normally occur (opportunistic infections or OIs) (Adams and Woelk 2014). Between 2000-2016 HIV infections fell by 39% and 13.1 million lives were saved (WHO 2017a) and approximately "1 million people died from AIDS-related illnesses in 2016" (UNAIDS 2017).

HIV/AIDS is at a political and social level a major global health problem (pathogenic threat), so the governmental approach to the problems of global health and security need to be addressed in a broader way (Ingram 2010) since the diseases spread faster and the problems of other countries cross borders (Brundtland 2003). By evaluating the effectiveness of the HIV programmes countries could improve their capacity to collect taxes from their citizens on the more sustainable basis, particularly amongst the middle-income countries (Ávila et al. 2013). That could be done by integrating human rights into HIV/AIDS programmes. Human rights are influential in framing governmental and intergovernmental responses to the pandemic (Meier, Brugh and Halima 2012).

Costs for ending the HIV/AIDS epidemic by 2020 will increase to US $ 29 million in low- and middle-income countries. That involves increasing HIV funding via donors as international, and domestic funding is not enough. The main financing goes towards revenue rising to pay for HIV interventions and services, financial risk protection and pooling (ensuring the continuation of HIV services without financial risks for the recipient as well as the provider) and improving efficiency in the use of health system resources (WHO 2016a).

UNAIDS (The Joint United Nations Programme on HIV/AIDS) provides a connection between governments and the private sector. Their main strategy is called 90-90-90 meaning that "by 2020 90% of the people living with HIV know their HIV status, 90%

of the diagnosed will receive sustained antiretroviral therapy and 90% of the people receiving therapy will have viral suppression" (UNAIDS).

In less developed countries there are insufficient health systems, and it is difficult to implement ART (antiretroviral therapy) which is the most effective mean of controlling OIs (opportunistic infections). There are many reasons for this, including the lack of medical workers and the higher cost of training them as opposed to other drugs used for treating HIV/AIDS. Key prevention of HIV/AIDS is the targeting of high-risk groups as it slows the epidemic from spreading (Adams and Woelk 2014).

WHO and UNAIDS are the main organisations dealing with HIV/AIDS programmes, there is also The Global Fund, which is mainly a financing institution, IAS (International Accounting Standards) which provides strategic programmes, initiatives and campaigns, USAID, which mainly provides financing, treatment, research on the matter, information also strategic coordination and communications, information, evaluation and informatics. CDC (Centres for Disease Control and Prevention) and IAPAC (International Association of Providers of AIDS Care) are accomplishing their missions through a comprehensive program of education, policy and advocacy and also by providing direct technical assistance, research and care provision (IAPAC). And there is also PEPFAR (The U.S President's Emergency Plan for AIDS Relief).

Thesis analyses if and how the number of people living with HIV is affected by international finances, ART and how human rights affect different international political implementations made. The first part of the thesis consists of a theoretical overview and previously conducted analytical researches. The second part of the thesis consists of methodology. The third part of the thesis consists of the analysis of data and regression model and the relation to previously overviewed theory.

2. Theoretical Framework

2.1 Medical overview, ART and treatment of HIV

HIV virus is a retrovirus that infects T-lymphocytes (also called CD4-cells or T-Cells are the immune cells which are a subtype of white blood cells) thus causing cytopathic effects and harming the lymphatic system (thus immune system) HIV can be categorized into HIV-1 and HIV-2, though the first is the most common. (Fauci and Lane 2015). In this thesis factors related to HIV-1 are examined.

HIV is transmitted by unprotected sexual contact (through semen, vaginal and cervical secretions), blood or blood products, transplanted tissue, transmission through injection drug use (syringes that are contaminated with blood and bodily fluids) and mother to infant (intrapartum, perinatally or via breastmilk) (Fauci and Lane 2015; Ahmad, Drew and Lagunoff 2018). HIV infection can be categorized into three stages: acute phase (flu-like symptoms), chronic phase (clinical latency, including the asymptomatic phase where the disease is not clinically apparent) and AIDS phase (increasing immunodeficiency and more frequently occurring OIs). HIV transmission could be reduced amongst infected people by condom usage, circumcision since the infection is facilitated by brakes in epithelial surfaces, and also by ART (Ahmad, Drew and Lagunoff 2018). Even behavioural approaches like mental health, induced stigma, and fear play a role in enhancing the outcome of the treatment (Collier and Sterck 2018). Earlier treatment of HIV (T cells count is over 250 cells per μL) is associated with 96% reduction in HIV transmission (Fauci and Lane, 2015).

AMC (adult male circumcision) is often seen as a cost-effective and cost-saving mean for prevention of heterosexual acquisition of HIV in men (Uthman et al. 2010) since it is reducing HIV transmission. Prevention effectiveness is observed at a biological level even though it also is dependent on behavioural indicators (for example cultural background affecting decisions concerning circumcision) (Kahn, Marseille and Auvert 2006). It is important to note that circumcision reduces the risk of acquisition of HIV by 60% in men and there is not enough evidence approving this theory for transmission to

females. Efficiency rates for latex condoms used to prevent HIV transmission bidirectionally are up to 98 percent to 99 percent (Ahmad, Drew and Lagunoff 2018).

Besides the means of prevention, the treatment of HIV is necessary. According to WHO "ART refers to the use of a combination of three or more ARV (antiretroviral) drugs involving lifelong treatment" (WHO 2017b). ARV drugs can be categorized into five main categories: Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTIs), Nonnucleoside Reverse Transcriptase Inhibitors (NNRTIs), Protease Inhibitors (PIs), Entry Inhibitors, Integrase Inhibitors (Flexner). ARV drugs can be further categorised into first-line drugs and second-line drugs (Long et al. 2010).

Since HIV is causing immunodeficiency by harming the lymphatic system, people with HIV are more receptive to different diseases. Including leading diseases causing mortality among adults and children which are mainly bacterial infections, tuberculosis, *Pneumocystis jirovecii* pneumonia (most common OIs amongst immunocompromised hosts). Among children, there are also diarrhoeal diseases, malnutrition and wasting (low weight for height) 1.1 million people die from AIDS-related causes (by the data of 2015) tuberculosis being the leading cause of morbidity, mortality, and hospitalization among people living with HIV. WHO recommended package to reduce mortality and morbidity among people with HIV consists: screening, treatment and/ or prophylaxis for major opportunistic infections and rapid ART initiation (WHO 2017b). If not properly treated, besides harming the host, some of these infectious diseases could spread faster amongst both HIV infected and not infected individuals.

2.2 Financing and international organisations

Per capita, HIV spending varies depending on the income levels and the type of epidemic of the country. By evaluating the effectiveness of the HIV programmes countries could improve their capacity to collect taxes from their citizens on the more sustainable basis, particularly amongst the middle- income countries. Since the expansion of access to HIV antiretroviral treatment to 8 million people has resulted in a reduction of HIV related deaths by 20 percent in the past five years. But assistance from international organisations

is critical since many low-income countries cannot pay the ART needed finances alone (Ávila et al. 2013).

Since primarily international organisations provide finances for ART but the end goal of HIV/AIDS epidemic varies by organisations it is important to also asses their main strategies to see the mainly financed area.

PEPFAR strategy for accelerating HIV/AIDS epidemic in 2017-2020 includes, besides providing for ART, expansion of HIV prevention and HIV negative risk avoidance strategies, expansion of voluntary male circumcision and acceleration of optimized HIV testing and treatment strategies. PEPFAR will support programmes that help to control the epidemic in the 13 high-burdened countries: Kenya, Zambia, United Republic of Tanzania, Uganda, Zimbabwe, Malawi, Lesotho, Côte d'Ivoire, Botswana, Namibia, Swaziland, Haiti and Rwanda (PEPFAR). Meaning that most of the financing will go towards ART by supporting the UNAIDS 90-90-90 strategy. US government has invested US $70 billion dollars in HIV/AIDS and tuberculosis programs. The US $ 4.3 billion was donated to The Global Fund to support the Global Fund's Fifth Voluntary Replenishment during the years of 2017-2019 (PEPFAR 2017).

The UNAIDS 90-90-90 strategy to help to end the AIDS epidemic means that 90% of people living with HIV are diagnosed, receive treatment and people receiving ART will have viral suppression. Besides treatment for HIV UNAIDS supports flexible health and community systems and also protection and promotion of human rights. Core prevention strategies include an elimination of mother-to-child transmission, condom programming, pre-exposure antiretroviral prophylaxis, voluntary medical male circumcision in priority countries, harm reduction services for people who inject drugs and focused prevention programming for key populations. (UNAIDS 2014). Key populations include men who have sex with men, people who inject drugs, sex workers, transgender people, prisoners, children, women and girls, young people and people with disabilities (AVERT).

All those prevention strategies need increased funding, reaching approximately US$ 18 billion by 2020 (UNAIDS 2014). WHO shares the 90-90-90 values of UNAIDS but ending AIDS epidemic as a public threat by 2030 according to their calculation takes US$ 26 billion in low- and middle-income countries (WHO 2016a). The Global fund focus on HIV is overlapping with the UNAIDS prevention strategies (The Global Fund 2017).

Global Fund runs their financing in three-year cycles allocating donor funds to eligible countries. Funding can be submitted separately for HIV, TB (tuberculosis) or malaria or as a package for all (The Global Fund).

It is important to note that although dependant on international financing ART programme financing strategies can differ by type of ownership into three categories. Private non- profit which sought multiple financial donors to sustain ART interventions. Thus being donor-dependent to provide ART without charging patients. Fee approximate to $ 1 was charged for every client visit to the clinic. Creating a VIP section to the hospital where higher fees were charged allowed to support frequent costs for the wider ART programme. Private for-profit hospitals require patients to pay for other costs of HIV care and treatment (which is lower than health costs for regular patients) with the exception of ARV drugs which are supplied without charge (funded by PEPFAR). Consultation fee for HIV patient is approximately $ 4 compared to the regular $ 20 consultation fee. Other medical necessities are covered by a medical insurance scheme. Public facilities sought additional funding from private philanthropic organisations and individual donors besides funding's from the national government and international organisations. ART financing only covers ARV drugs and commodities. Thus to cover other expenses (for example costs associated with OIs) health facilities need multiple funding sources to better avoid OIs (Zakumumpa, Bennett, and Ssengooba 2017).

Policies of donors and international organisations bear directly on the evolution of ARV markets in low- and middle-income countries. Medicines purchased with funds from UN (United Nations), GFATM (Global Fund to Fight AIDS, Tuberculosis, and Malaria) have to be pre-qualified by WHO prequel. In GFATM case drugs could be also qualified by US FDA (US Food and Drug Administration), the European Medicines Agency, or Health Canada. PEPFAR purchased ARV medicines have to be approved by the standard or the tentative FDA approval process. 98% of ARVs purchased in 2004-2006 were listed in WHO treatment guidelines. Newly recommended WHO ARVs are at high prices but low in demand and manufacture. There are only a few three-in-one Fixed-dose combination (FDC) drugs (Waning et al. 2010). Research based on Nigeria's facility-level data shows that cost of ART came up to $ 231 USD (on a facility level average). The cost was estimated by summing finances for staff, laboratory tests, ARV drugs, TB drugs, capital, utilities and training and the staff costs (nurses, doctors, health and indirect staff).

ARV drugs making 40 percent of total cost, staff 39 percent and laboratory tests 17 percent. Some costs could be reduced. For example, lowering staff cost could be done by shifting tasks. For example, certain tasks could be shifted from doctors to less specialized staff (Bautista-Arredondo et al. 2018).

2.3 HIV as a global political problem

HIV policy in the individual and population level could be divided into three approach categories. First behavioural approaches which include education, stigma reduction, delay sexual debut, decrease in the number of partners, increased availability and use of condoms, harm-reduction strategies (including needle exchange programs). Second structural approaches which include law and policy development, gender equity, access to services, cash transfer programs, decriminalizing determinants of infection, targeting programs and services to MSM (men who have sex with men). Third, biomedical approaches, which include testing STIs (sexually transmitted infections), PMCTC, male circumcision, antimicrobials/microbicides, PEP (post-exposure prophylaxis), PrEP (pre-exposure prophylaxis) and treatment as prevention. These preventions are best implemented combined to achieve a potentially more cost-effective and sustainable pre-emptive HIV response (Meier, Brugh and Halima 2012). But policy implementation at the moment is widest in relation to treatment and retention care, and poorer for HIV testing and PMTCT. National government guidelines are mostly only about ART, HIV testing, PMTCT and counselling (Cawley et al. 2017).

Integrating human rights into HIV/AIDS programmes could be influential in framing both governmental and intergovernmental responses to the pandemic (Meier, Brugh and Halima 2012). Violation of human rights is a continued problem amongst people with HIV. Laws and policies need further specifications to protect the human rights of those living with HIV and those at risk of HIV infection, especially those who are included in the key populations (WHO 2016b). Human rights focus on examining a separated individual although having a central role in the global HIV/AIDS programme. Although collective rights are similar to human rights, they act more at a social level, addressing the problem in a wider spectrum while human rights act on a perspective of an individual.

Collective rights, however, are indispensable in the health field. These rights could be realized for example through expansion of HIV testing thus preventing the spreading of the virus. (Meier, Brugh and Halima 2012). Besides collective rights, one solution could be decriminalizing sexual behaviours and drug use, same-sex behaviour and legalizing recognition of transgender status. Since there are difficulties in protecting the safety and well-being of these people and also those who provide HIV related health care. In order to increase the effectiveness of HIV and HIV related health services reduction of stigma, fear and discrimination are needed, especially those related to homophobia, transphobia, sex work and drug use is needed. There are also other policy changing methods and law enforcement that can help to reduce human and health right discrimination. For example, ensuring confidentiality of medical records. Since for example, same-sex activity is banned and being transgender is illegal in some countries many HIV cases are not reported (WHO 2016b).

Besides human rights which have an international impact, it could be argued that national policy types could affect the HIV/AIDS pandemic response. Comparative analysis was conducted by Gómez and Harris (2015) of AIDS responses in BRICS nations (Brazil, Russia, India, China and South Africa) by historical and civil-society dynamics. Results show that democracies do not have a better response to epidemics, politically repressive regimes might get better numeral outcomes. Effective civil society mobilization is much less costly and the engagement can lead to lost opportunities to control or reverse the direction of epidemics. In Brazil, influential AIDS NGOs pressured the government for a policy reform since there was an absence of political repression and civic mobilization. The success of influencing AIDS policies depends on the success of civil society organisations, pre-existing political contexts and the state's historic relationship with civil society.

Even though it could be said that NGOs are important strategic allies for reforming policies, in this thesis main focus will be on implementations of human rights, national and international policies affecting HIV/AIDS epidemic.

As mentioned people living with HIV and receiving ART rely mostly on international financing to cover the ARV drug costs. These factors are mainly influenced by country's income level, international policy, national policy and integration of collective and human

rights. Factors can influence each other both ways. Either by providing more art and international finances the changes can be seen in the number of people living with HIV. Or when the number of people living with HIV increases the number of people receiving ART and international finances invested increase jointly. As human rights could be influential in framing international and government policy implementations further analysis based on the actions executed by countries is necessary.

To analyse this problem more specifically three hypotheses are formed.

First two hypotheses are the variations of possible relationships between people living with HIV, people receiving ART and international finances:

1. As the number of ART and international finances increase the number people living with HIV stays at a fairly constant level.
2. As the number of people living with HIV increases the number of people receiving ART and international finances rise.

Third hypothesis is:

3. By forming the basis for implemented policies, human rights affect people receiving ART and international finances invested.

3. Methodology

Based on the theoretical information, it could only be assumed that when there are more ART, national and international finances provided the number of people living with HIV should stay constant. As there are more people knowing their HIV status that should lead to decrease in infections and spread of the disease as HIV treatment reduces the transmission of the virus. To further assess if and how much these relationships are affecting each other descriptive models are necessary.

A dataset was constructed by using World Bank division of countries by income levels (low-income economies; lower-middle-income economies; upper-middle-income economies and high-income economies). Data was defined by a 2008-2016 time interval (factor value).

Used data included The World Bank development indicators (The World Bank):

- Adults (ages 15+) living with HIV
- Adults (ages 15+) and children (ages 0-14) newly infected with HIV
- AIDS estimated deaths (UNAIDS estimates)
- Current health expenditure *per capita* (current US$)
- Antiretroviral therapy coverage (ART) (out of the number of people living with HIV)

And an added indicator:

- International finances provided to the countries based on the domestic HIV spending by funding source (UNAIDS data 2015)

Data were divided into dependent variable and independent variables.

To examine the effectiveness of international organisations a dependent variable of adults (ages 15+) living with HIV was chosen.

To assess the international organisation's actions effectiveness independent variables chosen were:

- Current health expenditure *per capita*
- ART
- International finances

Missing data of international finances by year was replaced by the data of years available. Due to the lack of information in indicators, some countries were excluded. Which left 50 countries to the final dataset based on the availability of data.

Following countries were chosen:

- Fourteen low-income: Burundi, Chad, Ethiopia, Haiti, Liberia, Malawi, Mali, Mozambique, Nepal, Nigeria, South Africa, Togo, Uganda and Zimbabwe.
- Twenty lower-middle-income: Angola, Burkina Faso, Cambodia, Cameroon, Côte d'Ivoire, El Salvador, Ghana, Guatemala, Honduras, India, Indonesia, Kenya, Lesotho, Myanmar, Niger, Sudan, Swaziland, Ukraine, Vietnam and Zambia.

- Fourteen upper-middle-income: Argentina, Botswana, Brazil, Columbia, Dominican Republic, Gabon, Iran (Islamic Republic), Malaysia, Mexico, Namibia, Papua New Guinea, Rwanda, Thailand and Venezuela (RB).
- Two high-income: Pakistan and Senegal.

Baseline data is added to Annex 1.

To verify the accuracy of the models and to identify the unusual observations several tests were made to test both hypotheses. Tests included VIF (variance inflation factor), Shapiro-Wilk test (test for normality) and Breush-Pagan test (heteroskedasticity test).

The first two hypotheses were analysed with the correlation matrix and the regression analysis. First hypothesis is predictive and the second hypothesis is descriptive.

Sprearman's correlation matrix was conducted in order to see the measured strength and the direction between two variables. Correlation above + 0,4 and -0,4 was considered a strong correlation. Due to multicollinearity correlations larger than 0,9 were left out.

Variables excluded from the matrix for both hypotheses due to multicollinearity were:

- AIDS estimated deaths (UNAIDS estimates)
- Adults (ages 15+) and children (ages 0-14) newly infected with HIV

Variable excluded due to low correlation (-0,08) was:

- Current health expenditure *per capita* (current US$)

Final models consisted of the dependent variable living with HIV and two independent variables. Income was used as a dummy variable on both cases.

For the regression model data validity is first examined by Spearman's correlation. A best-fit model was chosen by analysing different dependent variable relations to independent variables. Evaluating the fit of the model R-squared was measured with adjusted R-squared and Root MSE (root-mean-square-error) showing the fit and the variance of the residual in these models between the values.

First two hypotheses were both analysed by correlation and regression. The hypotheses with the lowest accuracy was excluded.

Statistical analyses were performed by using STATA software version 13.0.

By analysing the strength of the first hypothesis stated with correlation matrix and regression model it appeared that the fit and the significance outcome were not statistically important. Which might have been due to limited data. Hypothesis two had the best fit to the model. Since the predictive model was not possible with the final dataset instead a pilot study was conducted by using a descriptive analysis.

Hypothesis chosen was:

1. As the number of people living with HIV increases the number of people receiving ART and international finances rise.

R-squared value was 0,67 which implies that the strength of relationships between variables is strong. Significance level between variables was indicated by $p<0,5$.

4. Analysis and discussion

The first part will focus on the interpretation of the correlation matrix and the regression analysis made on the first hypotheses. The second part will analyse how ART and international financing affect the number of people living with HIV. The second part will focus more on the political implementations and human rights relating to indicators discussed in the first part.

4.1 Interpretation of the correlation matrix and the regression analysis

Table 1
Correlation between people living with HIV, people receiving ART and international finances invested

	Living with HIV	ART	International finance	Year
ART	**0.7728**			
International finance	**0.4602**	**0.4791**		
Income	-0.2086	-0.0756	-0.1007	-0.0284

Correlation matrix consists of dependent variable living with HIV and two independent variables (people receiving ART and intfinance) which had the best fit (table 1.). Most people living with HIV receive ART since the significance level is at 0,7728 (heavily correlated). International financing for ART is moderately correlated at the level of 0,4602. Correlation between variables is positive. Meaning when the number of people living with HIV increases both independent variables increase. Countries income level has a lower significance to the number of people living with HIV. Correlation between variables is negative. Meaning that when the number of people living with HIV increases independent variable decreases.

Table 2

Relationship of people living with HIV on people receiving ART and international financing

Living with HIV	Coefficient	Standard Error	t-statistic	P>| t |	95% Confidence Intervals for coefficients	
ART	3.328456	.2205595	15.09	0.000	2.893382	3.763531
International finance	.0004412	.0001488	2.97	0.003	.0001477	.0007346
Income	-97001.31	28348.19	-3.42	0.001	-152920.8	-41081.81

The significance level is indicated by $p<0,5$

Linear multiple regression was chosen to model relations between variables (Table 2). When looking at the model we are interpreting it as two populations where second has a one value increase in the number of people living with HIV. When the number of people living with HIV increases by 1 ART increases approximately 3 times. Meaning that for every patient with HIV they receive significant treatment as the minimum rise per person for basic treatment would be 1. For every unit increase in the number of people living with HIV income decreases. Meaning that there are more people living with HIV amongst the lower income countries. When looking at the coefficient for the international finances it might seem small due to the larger baseline data but is still significant in the model.

The international finance units increase by 0.004 when the number of people living with HIV increases by 1.

Based on these two models it could be said that when the number of people living with HIV raises the number of people receiving ART and international finances increases. It is also important to note that increasing numbers of HIV cases occur mostly in lower income countries. As the country's income level increases the number of people living with HIV decreases.

4.2 The impact of ART and international financing on the number of people living with HIV

As shown in the regression model and correlation matrix demonstrated when the number of people living with HIV increases the number of ART and international finance increase as well. Showing that implemented policies could be effective as they are increasing jointly. As the level of income increases the number of people living with HIV decreases. What was not expected was that national health expenditure *per capita* would not impact the model. One explanation for low impact of national health expenditure might be that ART financing only covers ARV drugs and commodities (Zakumumpa, Bennett, and Ssengooba. 2017). ARV drugs, however, make up 40 percent of total cost of ART (Bautista-Arredondo et al. 2018) and estimated mean cost for per-person for a year is $315. Cost per-person differentiates whether the patient comes from a low and lower-middle-income country or upper-middle-income country. Cost per-person is respectively $442 and $80 (PEPFAR 2014). The highest number of people living with HIV occur (based on data presented in Annex 1) amongst low and lower-middle-income countries. First being South Africa with 6800000 and following in descending order: Nigeria, India, Mozambique, Kenya, Uganda, Zimbabwe, Uganda, Zambia, Malawi. These are the ten countries with the highest number of people living with HIV and they all are low and lower-middle-income countries. Since ARV drugs are costlier and covered by international finance the HIV treatment financed by national health expenditure has a lower impact.

The reason, why the price is higher for low and lower-middle-income countries, could be explained by the type of ARV drugs used. Namely, the cost of second-line therapy (using second-line drugs) is approximately 2.4 times higher than for the first-line therapy (using first-line drugs) (Long et al. 2010). Lower prices for both second-line and first-line ARV drugs were associated with having an essential medicines list and price regulations. Higher prices were only significant for second-line ARV drugs with national procurement strategies Second-line ARV drugs might reflect higher medical need due to potential resistance or adverse effects of first-line drugs, which are most commonly used. (Liu and Galarraga 2017).

The problem of corruption might have an effect on ARV drug prices. Unitaid and PEPFAR have contracted two or three manufacturers thus the chosen manufacturers to dominate the market (Waning et al. 2010). When international organizations with a wide impact choose a few manufacturers the ARV drug prices get higher since there is no competition that comes with the free market system. GFTAM Voluntary Pooled Procurement (VPP) program will encourage the pooling of ARV volumes through third-party provision by introducing more large-scale buyers. Meaning that the market will now be concentrated around few large-scale purchasers increasing prices and corruption. Pooled provision might be attractive to governments of smaller countries as a way to reduce transactions costs and documented corruption. But in reality, the costs may not be lower (Waning et al. 2010).

Lower ARV prices are possible but continued innovation and quality must also be ensured for the drugs to be effective. A narrow focus on price alone might not be efficient in the terms of ART outcome (Waning et al. 2010). The staff makes up for 39 percent and laboratory tests for 17 percent of total ART costs (Bautista-Arredondo et al. 2018). One way of reducing these costs for ART and increase the uptake of HIV testing services is to use trained lay providers to perform HIV rapid tests using finger stick blood, oral fluids and pre and post-test counselling thus task-sharing and lowering the workload of medical workers (Flynn et al. 2017).

Lowering the cost of ART (especially for low and low-middle-income countries) could be possible through implementing HIV prevention strategies. For example, by AMC (adult male circumcision). AMC is seen as a cost-effective and cost-saving mean for

prevention of heterosexual acquisition of HIV in men (Uthman et al. 2010) since it is reducing HIV transmission. But at the same time efficiency rates for latex condoms used to prevent HIV transmission bidirectionally are up to 98 percent to 99 percent (Ahmad, Drew and Lagunoff 2018). As well as lower in cost, since AMC is more time and finance consuming. AMC in combination with latex condoms would have a high effectiveness rate. But it must be considered that AMC is not as cost-effective as latex condoms since it takes more healthcare finances.

4.3 The impact of political and human right implementations on the ART, international finances and number of people living with HIV

Although the number of ART per person described in the model is high there is still room for improvement as. Even though it could be said that due to the rise in ART and finances with the number of people living with the implemented policies must be effective. It must be noted that people in the model have been diagnosed with HIV there is still a number of people undiagnosed due to multiple reasons like stigma, fear and discrimination. That is why it is also important to promote different policies, collective and human rights to reduce stigma and for more people to get tested for HIV thus reducing the risk of infection spreading.

Since the duty to rescue people with HIV is moral minimalism it is convenient for policymaking in democracy (Collier and Sterck 2018). When analysing the international finances and political implementations we must consider that even though not directly measured, different policies implemented affect the indicators related to people living with HIV, ART and international finances given to countries. To better analyse the HIV/AIDS-related policy implementations HIV/AIDS country progress reports are used since direct approach by the country is best shown. Example countries are apparent in the correlation model (table 1.) and regression model (table 2.).

Botswana, for example, has adopted by the year 2016 different UNAIDS 90-90-90 related targets, including for example development of the HIV testing services. Also being in the process of improving the distribution of HIV test kits across districts and launching new guidelines and plans. The country is also planning to adopt lay provider testing. Even

though there are still problems in the discriminatory areas, national strategies, discriminatory and punitive laws for protecting people living with HIV and vulnerable populations are at work. Right now the country is lacking in prevention strategies (National AIDS Coordinating Agency Ministry of Ministry of Health and Wellness Botswana 2017).

Burundi has partly regulated laws and policy's specifying for HIV testing. But when looking at key populations transgender people and sex workers are still criminalized and prosecuted (Country progress report-Burundi 2017). Colombia and Kenya have both implemented legal protections for key populations by constitutional prohibition of discrimination based on occupation or diversity amongst transgender people and sex workers (Country progress report-Colombia 2017: Country progress report-Kenya 2017).

In Kenya selling and buying sexual services is criminalized and men who have sex with men face imprisonment up to 14 years (Country progress report-Kenya 2017). Nepal has made targeted interventions amongst HIV key populations by improving HIV testing and prevention policies. For example, testing and counselling for HIV care and support, reproductive health and sexually transmitted infections. They have also implemented the identification of the existence of "gender and sexual minorities" in its constitution (Government of Nepal Ministry of Health National Centre for AIDS and STD Control)

Ukraine has transferred procurement for ARVs and laboratory commodities to international agencies as an anticorruption measure and as a response to stagnation in the national procurement capacity (Global AIDS Monitoring 2017: Ukraine).

By analysing political strategies of countries which are included in the baseline data it can be seen that there is a lack of implementation of human rights. Collective rights are better implemented as they are easily realized for example through expansion of HIV testing as was seen amongst Burundi and Nepal. Violation of human rights is a continued problem as seen from regulations of laws for HIV key populations. And even though when some key populations were legalized some still criminalized. Meaning that the key population might not get tested for the reasons mentioned above that could result in a significant number of people not getting tested for HIV.

It must be noted that the data for most countries was not sufficient for more precise deductions. For many countries, specific regulations and policies were missing and reports were more focused on the medical part and situation analysis.

5. Conclusion

Earlier treatment of HIV (T cells count is over 250 cells per μL) is associated with 96% reduction in HIV transmission (Fauci and Lane 2015). Reaching the 90-90-90 strategy to help to end the AIDS epidemic means that 90% of people living with HIV are diagnosed, receive treatment and people receiving ART will have viral suppression. For that more cost-effective means are needed, and finances need to be better divided. ARV drugs right now make 40 percent of the total cost leaving very little to the other health services financing. And even though some means are claimed to be more cost effective (for example AMC) in the long run when including the finances, it might not be so in reality.

To further assess if and how much these relationships are affecting each other descriptive models were created. As human rights could be influential in framing international and government policy implementations they were included in the analysis.

Three hypotheses were formed. The first stating that as the number of ART and international finances increase the number people living with HIV stays at a fairly constant level. The second stating that as the number of people living with HIV increases the number of ART provided and international finances invested raise. The third hypothesis stating that by forming the basis for implemented policies, human rights affect people receiving ART and international finances invested. The chosen variables were, dependent variable-people living with HIV, and independent variables people receiving ART and international finances. Data were examined by Sprearman's correlation matrix and the regression model. Due to the lack of data the first hypothesis of ART and international finances invested affecting the number of people living with HIV was not used. The second hypothesis was better confirmed by the correlation matrix and regression model. It was also found that as the country's income level increases the number of people living with HIV decreases.

Even though ART and international finances increasing jointly with the number of people living with HIV could implement that the implied policies are effective. It is also important to note that there might still be a significant number of people not tested. Thus the importance of integrating human rights into HIV/AIDS programmes is influential in framing governmental and intergovernmental responses to the pandemic.

Country progress reports on HIV/AIDS progress of countries appearing in the baseline statistical data were made as an example of policy and human rights implementations. It was seen that there was a lack of implementation of human rights. Collective rights were better implemented as they are easily realized through the expansion of HIV testing Violation of human rights was a continued problem as seen from regulations and laws for HIV key populations. Some key populations were legalized others still criminalised. To reduce fear, stigma and discrimination and for more people to get tested for HIV wider implementation of human rights is necessary. Right now most national government guidelines only include ART and HIV testing.

More precise political implementations are necessary to see a greater effect on the people living with HIV, ART and financing. It was noted that in many cases country progress reports were missing data and examples of policies implemented. Lacunal data on the topic is leaving unexplained reasons how and what is precisely more affecting the number of people living with HIV.

Rahvusvaheliste organisatsioonide mõju võitluses HIV/AIDS-iga

Kerstin-Gertrud Kärblane

Resümee

HIV viirushaigusesse haigestunute arv suureneb iga aastaga umbes 1,8 miljoni võrra. HIV/AIDS nõrgestab inimese immuunsüsteemi, põhjustades lisaks olemasolevale viirusele, mitmete teise nakkushaigustega nakatumist. Kuna haiguse levik on kiire ning oht on globaalne siis osutub see ka probleemiks rahvusvaheliselt. Haiguse raviks kasutatakse hetkel ART ehk retroviiruse vastast ravi, mis hõlmab endas ravimeid ning erinevaid haigusega seonduvaid protsesse (erinevad meditsiinilised testid, konsultatsioonid jne). Haigusega seostuvad poliitilised ja inimõiguste teemalised probleemid vajavad paremat ja täpsemat käsitlust, et vähendada HIV nakatunute arvu. Mida tervem on rahvas seda rohkem saab riik pidevat maksutulu oma kodanikelt.

Erinevateks ennetavateks võimalusteks on panustada hariduspoliitikasse, õigusloomesse, kaitsmaks nakatunute ning peamises riskigrupis olevaid inimesi ning biomeditsiinilistesse meetmetesse. Peamisesse riskigruppi kuuluvad inimesed, kelle õigused on piiratud mitmetes riikides ning kes oma tegevustega osutuvad nakkusele kergemini vastuvõtlikuks. Näiteks homoseksuaalid, narkootikume süstivad inimesed ning prostitutsiooniga tegelevad inimesed.

Peamised organisatsioonid, kes tegelevad HIV/AIDSI ennetamise ning ravi programmidega, on PEPFAR, UNAIDS ning WHO. Rahvusvaheliste organisatsioonide poliitilised otsused mängivad olulist rolli ravi kujunemisel ning ravimite hindades. Enne erinevate ravimite ostmist peavad need olema ka teiste organisatsioonide poolt kontrollitud, kuid peamiselt ostetakse ravimeid, mis on loetletud WHO ravijuhendis. Ka inimõiguste integreerimine HIV programmidesse on oluline, kuna HIV nakatunute ning riskigruppi kuuluvate inimeste õigused ei ole sageli tagatud. Seega on erinevate stigmade, hirmude ning diskrimineerimise vähendamine oluline, et kõik inimesed saaksid paremamaid teenuseid seoses haiguse tuvastamisega ning raviga.

Seega võib oletada, et lisaks ART-i ning rahvusvahelisele rahastusele mõjutab HIV-ga elavaid inimesi ka riigi oma rahastus tervisesektoris.

Töö käigus püstitati kolm hüpoteesi. Esimene hindas rahvusvahelise rahastuse ja ART mõju HIV-ga elavate inimeste arvule (ennustav mudel) Teine hüpotees hindas HIV-ga elavate inimese kasvuga koos suurenevat rahvusvahelist rahastust ning ART ravi (piloot uuring). Kolmandaks, poliitilised ning inimõigustega seonduvad meetmeid mõjutavad rahvusvahelist rahastust ning saadavat ravi (ART).

Kahe esimese hüpoteesi mõju täpsemaks hindamiseks teostati korrelatsioon- ja regressioonanalüüs. Algsesse valimisse kuulusid: HIV-ga elavad inimesed, rahvusvaheline rahastus, riigipõhine tervise rahastus, AIDS-i surmad ning HIV-iga nakatunute arv. Vaadeldavad riigid valiti sissetulekute tasemete järgi (madala sissetulekuga, madala keskmise sissetulekuga, kõrge keskmise sissetulekuga ning kõrge sissetulekuga). Andmete puudusel eemaldati valimist riike ning alles jäi 50 riiki. Kuna valim polnud piisav ennustavaks mudeliks teostati pilootuuring. 50 riigiga teostatud analüüsidest järeldus, et peamiselt mõjutab HIV-ga elavaid inimesi ART ja rahvusvaheline rahastus. Seega HIV-ga nakatunud inimesed sõltuvad suuresti oma ravis rahvusvaheliste organisatsioonide rahastusest. Riigi oma rahastus ning teised näitajad ei omanud suurt mõju mudelis HIV-ga elavatele inimestele. ART kasv koos inimestega kes elavad HIV-iga oli oluliselt suur, millest võib järeldada, et rakendatavad poliitikad on olnud edukad. Märkida tuleb, et mudel ei kaasa inimesi kellel pole diagnoositud HIV-d seega on vajalikud edasised meetmete rakendused keskendumaks inimeste testimisele vähendamaks viiruse nakkusohtlikuks. Mida rohkem inimesi teab oma HIV haigusest ning saab ravi seda väiksem on tõenäosus edasikandumiseks.

Saavutamaks UNAIDSI 90-90-90 strateegiat, kus 90 protsenti inimestest on diagnoositud ning saavad ravi on vaja siiski lisaks rahvusvahelisele rahastusele ka suuremat riigi omapoolset panust vältimaks uusi haigusjuhtumeid. Vajalikud oleks täpsemad uuringud, et paremini hinnata, kuidas tehtavad poliitilised otsused mõjutavad HIV-ga elavaid inimesi ning nende ravi.

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Annex 1

Country (low income)	Year	Newly infected	Health expenditure	AIDS deaths	Living with HIV	INT finance	ART
Burundi	2008	4000	184239192	7800	83000	20204374	12450
Burundi	2009	4400	2204855877	7100	80000	24950075	15200
Burundi	2010	4400	2613816583	6400	78000	39908205	19500
Burundi	2011	4200	2577428698	5500	76000	23408823	22040
Burundi	2012	3900	2162524176	4800	75000	36476780	24750
Burundi	2013	3500	2203444551	4300	74000	39481263	27380
Burundi	2014	3200	2020157561	4100	73000	0	31390
Burundi	2015	2600	2428560168	3500	72000	0	36000
Burundi	2016	2200	0	2900	72000	0	43920
Chad	2008	7200	3788076904	5600	90000	11652559	16200
Chad	2009	6500	3586364862	4000	92000	10463370	22080
Chad	2010	6200	3648620983	3600	94000	7929254	28200
Chad	2011	6000	3872567404	3600	95000	15164149	28500
Chad	2012	5900	3492486746	4000	96000	9884338	31680
Chad	2013	5500	4742296057	4000	97000	12886293	34920
Chad	2014	5800	4688535547	4200	98000	0	43120
Chad	2015	5000	3556909713	3600	100000	0	54000
Chad	2016	4800	0	2800	100000	0	39000
Ethiopia	2008	22000	1340835723	57000	650000	210000000	110500
Ethiopia	2009	22000	1480748258	47000	630000	0	151200
Ethiopia	2010	23000	1679140775	39000	610000	0	189100
Ethiopia	2011	24000	1526548301	32000	610000	350000000	225700
Ethiopia	2012	25000	2087776231	26000	610000	0	250100
Ethiopia	2013	27000	2007690426	25000	620000	0	279000
Ethiopia	2014	28000	2250598448	24000	630000	0	327600
Ethiopia	2015	30000	2427819125	22000	640000	0	352000

Ethiopia	2016	30000	0	20000	650000	0	383500
Haiti	2008	11000	5055632226	7400	130000	140000000	19500
Haiti	2009	11000	573187032	6500	130000	130000000	24700
Haiti	2010	11000	6853236416	6100	130000	160000000	27300
Haiti	2011	10000	7837832202	6400	130000	210000000	31200
Haiti	2012	9500	7668530846	6200	140000	0	42000
Haiti	2013	9000	5819069094	5700	140000	0	51800
Haiti	2014	8700	5895661459	5100	140000	0	58800
Haiti	2015	8300	5357394448	4800	140000	0	64400
Haiti	2016	7900	0	4600	150000	0	82500
Liberia	2008	2300	2559430642	4400	43000	0	1720
Liberia	2009	2400	3208361643	4200	42000	0	2520
Liberia	2010	2400	3267554342	3900	40000	28274595	4000
Liberia	2011	2500	3997556887	3500	39000	30933572	5070
Liberia	2012	2700	385291602	3200	39000	0	4680
Liberia	2013	3000	4162495422	3000	39000	0	5850
Liberia	2014	3100	6463458129	2900	39000	0	6240
Liberia	2015	3000	6929014961	2900	39000	0	6630
Liberia	2016	2900	0	2800	39000	0	7410
Malawi	2008	64000	3205834745	57000	800000	100000000	128000
Malawi	2009	61000	3479434998	51000	810000	71804797	170100
Malawi	2010	59000	3322835282	45000	820000	65560000	213200
Malawi	2011	54000	3838077056	41000	840000	77390000	277200
Malawi	2012	49000	3175400262	37000	850000	0	348500
Malawi	2013	45000	3854927575	32000	870000	0	408900
Malawi	2014	42000	3441162976	28000	880000	0	466400
Malawi	2015	39000	3422346802	26000	900000	0	522000
Malawi	2016	36000	0	24000	920000	0	607200
Mali	2008	7900	3314415863	6100	100000	35990239	15000
Mali	2009	7200	3273189198	5700	100000	22879948	19000

Mali	2010	6600	313685016	5500	100000	30015865	22000
Mali	2011	6300	3424137183	5200	100000	17896310	26000
Mali	2012	6300	3422156377	4800	99000	15450592	24750
Mali	2013	6600	42195893	5300	99000	0	24750
Mali	2014	6400	4785089271	6200	98000	0	27440
Mali	2015	6100	4229922694	6400	97000	0	31040
Mali	2016	5900	0	6100	96000	0	33600
Mozambique	2008	160000	2321998061	81000	1400000	140000000	126000
Mozambique	2009	150000	2301493027	79000	1500000	0	150000
Mozambique	2010	150000	2145723117	81000	1500000	0	195000
Mozambique	2011	150000	2335510693	82000	1500000	250000000	240000
Mozambique	2012	140000	3060811274	83000	1600000	0	272000
Mozambique	2013	120000	2846995455	84000	1600000	0	432000
Mozambique	2014	100000	3444261128	79000	1600000	0	560000
Mozambique	2015	95000	2829781169	70000	1600000	0	704000
Mozambique	2016	83000	0	62000	1600000	0	864000
Nepal	2008	3000	1923009454	2600	38000	0	2280
Nepal	2009	2400	2120324868	2500	37000	19713138	3330
Nepal	2010	2200	299717974	2500	37000	0	4810
Nepal	2011	2000	34319381	2400	36000	0	6120
Nepal	2012	1700	3350667901	2300	35000	0	7350
Nepal	2013	1500	3699805929	2200	34000	0	8500
Nepal	2014	1300	4138941043	2100	33000	0	9900
Nepal	2015	1100	444173729	1900	32000	0	11520
Nepal	2016	1000	0	1700	31000	0	12400
Nigeria	2008	230000	8143559997	210000	2900000	360000000	232000
Nigeria	2009	230000	6791492142	200000	2800000	320000000	280000
Nigeria	2010	230000	7607782636	200000	2800000	370000000	308000
Nigeria	2011	230000	8393624495	210000	2800000	410000000	364000
Nigeria	2012	220000	916303815	200000	2800000	440000000	448000

Nigeria	2013	220000	10176868861	190000	2800000	0	588000
Nigeria	2014	210000	10731129835	170000	2900000	0	667000
Nigeria	2015	220000	9730686106	160000	2900000	0	754000
Nigeria	2016	220000	0	160000	2900000	0	870000
South Africa	2008	450000	3723551131	260000	5400000	0	540000
South Africa	2009	410000	4130740827	240000	5500000	270000000	825000
South Africa	2010	380000	53956761477	210000	5700000	0	1140000
South Africa	2011	350000	59735944784	190000	5900000	0	1593000
South Africa	2012	340000	57974856297	150000	6000000	0	2040000
South Africa	2013	320000	52649957517	130000	6200000	0	2480000
South Africa	2014	300000	50983326095	110000	6400000	0	2880000
South Africa	2015	290000	47079699332	110000	6600000	0	3234000
South Africa	2016	270000	0	110000	6800000	0	3808000
Togo	2008	6200	2366442061	8600	100000	14292840	9000
Togo	2009	5900	2614805602	8400	100000	11421701	14000
Togo	2010	5500	3093862791	7600	98000	13512726	18620
Togo	2011	4800	3460344691	6700	95000	16113033	21850
Togo	2012	4700	3450712886	6300	93000	12328341	23250
Togo	2013	4600	3828368022	5900	92000	0	27600
Togo	2014	4500	4011070061	5900	90000	0	30600
Togo	2015	4100	3664787882	5600	89000	0	34710
Togo	2016	4100	0	5100	88000	0	44880
Uganda	2008	100000	5134829778	76000	1000000	260000000	130000
Uganda	2009	110000	4846931386	69000	1100000	0	176000
Uganda	2010	99000	6266848192	63000	1100000	0	220000
Uganda	2011	94000	536802174	57000	1100000	0	264000
Uganda	2012	84000	5327356031	52000	1200000	0	396000
Uganda	2013	74000	4963246481	43000	1200000	0	528000
Uganda	2014	60000	5290539519	36000	1200000	0	660000
Uganda	2015	54000	4605846472	31000	1200000	0	720000

Uganda	2016	52000	0	28000	1300000	0	871000
Zimbabwe	2008	85000	0	80000	1200000	26989448	144000
Zimbabwe	2009	83000	0	71000	1200000	61552177	216000
Zimbabwe	2010	73000	7763721647	59000	1200000	160000000	348000
Zimbabwe	2011	66000	7114893849	47000	1200000	170000000	456000
Zimbabwe	2012	59000	6998601317	41000	1200000	220000000	528000
Zimbabwe	2013	55000	6878401188	37000	1200000	220000000	624000
Zimbabwe	2014	49000	8185889165	33000	1200000	0	732000
Zimbabwe	2015	44000	9429000594	31000	1200000	0	816000
Zimbabwe	2016	40000	0	30000	1200000	0	900000

Country (lower middle income)	Year	Newly infected	Health expenditure	AIDS deaths	Living with HIV	INT finance	ART
Angola	2008	23000	13537606862	8600	170000	7687283	11900
Angola	2009	24000	12000439409	9000	180000	18379174	16200
Angola	2010	25000	967489729	9400	190000	18187724	20900
Angola	2011	26000	12222687671	9900	200000	12015142	24000
Angola	2012	26000	12248093963	11000	210000	0	27300
Angola	2013	26000	14378773001	11000	230000	0	39100
Angola	2014	25000	13184200753	11000	240000	0	50400
Angola	2015	25000	10855953548	11000	250000	0	57500
Angola	2016	25000	0	11000	260000	1976746015	57200
Burkina Faso	2008	4100	2978364972	7600	86000	35887066	17200
Burkina Faso	2009	3900	3159088375	6400	84000	35828848	21840
Burkina Faso	2010	3900	3391081732	5700	83000	38997892	25730
Burkina Faso	2011	3900	3468530369	4900	83000	27524274	30710
Burkina Faso	2012	3800	3297102135	4100	83000	22348665	32370
Burkina Faso	2013	3900	4301057125	4200	83000	0	35690
Burkina Faso	2014	3700	3955127795	4200	83000	0	39840

Burkina Faso	2015	3400	3344341877	3700	84000	0	46200
Burkina Faso	2016	3400	0	3100	84000	0	50400
Cambodia	2008	2300	4923015402	3300	78000	46585415	29640
Cambodia	2009	2000	5598244138	2800	77000	51994840	35420
Cambodia	2010	1600	5445417894	2600	75000	55571098	39750
Cambodia	2011	1300	6621792342	2500	74000	46569946	43660
Cambodia	2012	1200	6906166782	2500	73000	44713950	45990
Cambodia	2013	1000	7008952996	2400	71000	0	47570
Cambodia	2014	1000	6786517096	2300	69000	0	48990
Cambodia	2015	1000	695850378	2000	68000	0	51680
Cambodia	2016	1000	0	1800	67000	0	53600
Cameroon	2008	42000	6145114496	28000	500000	32949334	55000
Cameroon	2009	39000	5796943368	28000	510000	63401167	71400
Cameroon	2010	36000	5896177642	27000	510000	40916286	81600
Cameroon	2011	35000	4859146001	28000	510000	34159215	96900
Cameroon	2012	34000	6270305079	28000	520000	30513008	114400
Cameroon	2013	33000	6726609211	29000	520000	0	119600
Cameroon	2014	33000	7124243367	31000	520000	0	135200
Cameroon	2015	31000	6362799174	31000	510000	0	153000
Cameroon	2016	32000	0	29000	510000	0	188700
Côte d'Ivoire	2008	25000	760630344	31000	500000	56776965	90000
Côte d'Ivoire	2009	27000	757871072	31000	490000	120000000	78400
Côte d'Ivoire	2010	25000	7497885684	29000	480000	110000000	76800
Côte d'Ivoire	2011	24000	7344966459	26000	470000	87632863	89300
Côte d'Ivoire	2012	24000	7529444006	29000	460000	0	101200
Côte d'Ivoire	2013	23000	7223057388	30000	450000	0	99000
Côte d'Ivoire	2014	22000	7905314337	31000	440000	0	127600
Côte d'Ivoire	2015	21000	7545261707	29000	430000	0	146200
Côte d'Ivoire	2016	20000	0	25000	420000	0	172200
El Salvador	2008	1500	21794343683	1000	22000	7953330	5720

El Salvador	2009	1500	22995543951	1000	22000	0	7040
El Salvador	2010	1400	24024166267	1000	22000	11455432	8140
El Salvador	2011	1300	25434715207	1000	23000	0	8740
El Salvador	2012	1200	25660454513	1000	23000	13976689	8970
El Salvador	2013	1100	26953929088	1000	23000	13764792	9890
El Salvador	2014	1100	27109835415	1000	23000	0	10120
El Salvador	2015	1000	28315663041	1000	23000	0	10350
El Salvador	2016	1000	0	1000	23000	0	11040
Ghana	2008	16000	7844189486	30000	290000	32588547	20300
Ghana	2009	16000	7070895365	27000	270000	40544315	27000
Ghana	2010	17000	8554368917	25000	260000	48015481	33800
Ghana	2011	17000	9592606699	22000	260000	60807945	52000
Ghana	2012	17000	8899614253	19000	250000	0	60000
Ghana	2013	18000	10462707984	18000	250000	0	65000
Ghana	2014	19000	7675251824	17000	250000	0	72500
Ghana	2015	20000	795882796	16000	260000	0	72800
Ghana	2016	20000	0	15000	260000	0	88400
Guatemala	2008	2600	18230493083	1000	33000	0	9570
Guatemala	2009	2600	17441423831	1000	35000	14480297	10500
Guatemala	2010	2300	18112022315	1000	36000	12885696	11520
Guatemala	2011	2500	19676313812	1000	38000	14967041	13300
Guatemala	2012	2600	20665829408	1000	40000	20625980	14800
Guatemala	2013	2600	21476041475	1000	41000	0	15580
Guatemala	2014	2700	22884121573	1000	42000	0	15960
Guatemala	2015	2800	22438026443	1300	44000	0	15840
Guatemala	2016	2900	0	1600	44000	0	15840
Honduras	2008	1000	14312310451	1500	24000	15016590	6000
Honduras	2009	1000	15414152416	1400	23000	13385132	6670
Honduras	2010	1000	15900027043	1300	23000	15716346	7360
Honduras	2011	1000	16203737262	1300	22000	15691183	7920

Honduras	2012	1000	18370955726	1200	22000	17981687	8800
Honduras	2013	1000	17589269834	1100	21000	17236972	9030
Honduras	2014	1000	17254463798	1100	21000	0	9450
Honduras	2015	1000	17661324708	1000	21000	0	10080
Honduras	2016	1000	0	1000	21000	0	10710
India	2008	120000	3799359996	140000	2100000	120000000	210000
India	2009	110000	3841241243	130000	2000000	120000000	280000
India	2010	100000	4525077162	120000	2000000	0	380000
India	2011	99000	4872283264	100000	2000000	0	480000
India	2012	96000	4905140288	96000	2000000	0	580000
India	2013	93000	5621882423	88000	2000000	0	720000
India	2014	89000	5715113981	76000	2000000	0	800000
India	2015	86000	6331774153	68000	2000000	0	880000
India	2016	80000	0	62000	2000000	0	980000
Indonesia	2008	61000	6066673798	16000	430000	29718019	8600
Indonesia	2009	62000	6390408452	20000	470000	38966576	14100
Indonesia	2010	61000	10749196512	23000	500000	41224115	20000
Indonesia	2011	60000	12147174866	26000	530000	42815648	26500
Indonesia	2012	58000	12447353437	30000	560000	50150781	33600
Indonesia	2013	56000	12204151855	33000	580000	0	34800
Indonesia	2014	53000	12007919041	35000	590000	0	47200
Indonesia	2015	50000	11176174384	37000	600000	0	60000
Indonesia	2016	48000	0	38000	610000	0	79300
Kenya	2008	83000	4433673174	86000	1300000	590000000	221000
Kenya	2009	83000	489815055	74000	1300000	560000000	299000
Kenya	2010	79000	6191234767	64000	1300000	590000000	377000
Kenya	2011	77000	5477529974	57000	1300000	600000000	468000
Kenya	2012	78000	6534393673	49000	1400000	550000000	560000
Kenya	2013	77000	6985223012	48000	1400000	580000000	588000
Kenya	2014	73000	7298606376	47000	1400000	0	672000

Kenya	2015	66000	7006302021	43000	1400000	0	798000
Kenya	2016	62000	0	36000	1500000	0	960000
Lesotho	2008	21000	721477566	10000	240000	35021784	43200
Lesotho	2009	21000	8277605893	9100	240000	0	57600
Lesotho	2010	22000	7971178656	8500	250000	0	72500
Lesotho	2011	21000	10260650736	8100	260000	0	75400
Lesotho	2012	22000	10252765547	8800	280000	0	86800
Lesotho	2013	23000	9843654719	9400	290000	0	95700
Lesotho	2014	22000	10303810473	10000	300000	0	105000
Lesotho	2015	22000	9085011948	10000	310000	0	124000
Lesotho	2016	21000	0	9900	310000	0	164300
Myanmar	2008	18000	1044496719	17000	240000	31276403	14400
Myanmar	2009	16000	1365033943	17000	230000	32428850	20700
Myanmar	2010	15000	1533668661	16000	230000	37904167	29900
Myanmar	2011	14000	1931740944	15000	220000	42349184	37400
Myanmar	2012	13000	2328002468	14000	220000	0	50600
Myanmar	2013	13000	2385394437	12000	220000	0	66000
Myanmar	2014	12000	6239306517	10000	220000	0	83600
Myanmar	2015	12000	5912304205	8900	220000	0	103400
Myanmar	2016	11000	0	7800	220000	0	121000
Niger	2008	2700	2382330835	4800	55000	11893507	2200
Niger	2009	2400	2326017372	4700	52000	9988336	5720
Niger	2010	2000	2175313433	4000	51000	14111145	6630
Niger	2011	2100	2423289025	3900	49000	13635812	8330
Niger	2012	2100	2350533974	3700	47000	10760854	9870
Niger	2013	2000	253403301	3400	46000	0	10580
Niger	2014	2000	2521038814	3200	45000	0	9900
Niger	2015	2000	2572284735	3400	43000	0	11180
Niger	2016	1800	0	3400	42000	0	13440
Sudan	2008	4800	10200115865	1700	35000	14585346	1050

Sudan	2009	5100	10565264704	1700	38000	13284928	1900
Sudan	2010	5100	10385327215	1700	41000	0	2050
Sudan	2011	5100	11611350068	2000	44000	14477993	2200
Sudan	2012	5100	953208582	2300	46000	12345112	2300
Sudan	2013	5100	11773562175	2500	48000	9052243	3360
Sudan	2014	5000	11080975378	2700	50000	0	4000
Sudan	2015	5000	15178722854	2900	51000	0	4080
Sudan	2016	5000	0	3000	53000	0	5300
Swaziland	2008	13000	20080815852	7700	160000	0	30400
Swaziland	2009	13000	20952597083	7000	160000	42837711	36800
Swaziland	2010	13000	31321313673	6500	170000	0	56100
Swaziland	2011	12000	33043558657	5300	170000	55863617	64600
Swaziland	2012	12000	28432861506	4800	180000	56115914	79200
Swaziland	2013	12000	2645405386	4300	190000	63776395	95000
Swaziland	2014	11000	25253438229	4000	190000	0	114000
Swaziland	2015	9800	23271534771	3900	200000	0	138000
Swaziland	2016	8800	0	3900	200000	0	158000
Ukraine	2008	13000	21565725617	12000	200000	40530098	10000
Ukraine	2009	13000	168201981	12000	200000	26558619	16000
Ukraine	2010	16000	18873646253	12000	200000	33877730	22000
Ukraine	2011	17000	22327625733	11000	200000	0	26000
Ukraine	2012	17000	26247145977	11000	210000	0	42000
Ukraine	2013	17000	28187738382	8500	210000	0	54600
Ukraine	2014	17000	18259447194	7000	220000	0	66000
Ukraine	2015	17000	12504652052	6700	230000	0	59800
Ukraine	2016	17000	0	8500	230000	0	85100
Vietnam	2008	19000	5738314183	9500	210000	100000000	25200
Vietnam	2009	18000	6261286009	8500	220000	94161904	37400
Vietnam	2010	17000	7671438475	8600	230000	100000000	48300
Vietnam	2011	16000	8731325051	9000	230000	73756583	59800

Vietnam	2012	15000	1115905283	9100	240000	65119393	72000
Vietnam	2013	14000	11923131051	9200	240000	0	81600
Vietnam	2014	13000	11636020296	8900	240000	0	88800
Vietnam	2015	12000	11673619366	8600	240000	0	103200
Vietnam	2016	11000	0	8000	240000	0	112800
Zambia	2008	69000	5576964	43000	830000	0	199200
Zambia	2009	68000	4902904194	35000	860000	0	249400
Zambia	2010	67000	6736954123	29000	900000	0	306000
Zambia	2011	68000	7930013119	27000	940000	0	376000
Zambia	2012	67000	8161532371	25000	970000	260000000	426800
Zambia	2013	68000	8988045063	24000	1000000	0	500000
Zambia	2014	68000	8709195162	22000	1100000	0	605000
Zambia	2015	62000	6936708094	22000	1100000	0	704000
Zambia	2016	59000	0	21000	1100000	0	715000

Country (upper middle income)	Year	Newly infected	Health expenditure	AIDS deaths	Living with HIV	INT finance	ART
Argentina	2008	5300	56732801042	2000	93000	6482770	47430
Argentina	2009	5300	57681118144	2000	96000	728886	50880
Argentina	2010	5300	69860349564	2000	99000	0	54450
Argentina	2011	5300	80685994946	2100	100000	0	56000
Argentina	2012	5300	86450535407	2200	100000	0	58000
Argentina	2013	5400	92081287954	2200	110000	0	66000
Argentina	2014	5400	84505468735	2300	110000	0	67100
Argentina	2015	5400	99793137533	2400	110000	0	69300
Argentina	2016	5500	0	2400	120000	0	76800
Botswana	2008	13000	32145602757	8000	290000	110000000	107300
Botswana	2009	13000	34981400746	6600	290000	86185023	127600
Botswana	2010	13000	38096642295	5800	300000	100000000	150000

Botswana	2011	13000	47145818324	5600	310000	91393937	167400
Botswana	2012	13000	49865686686	5100	320000	0	195200
Botswana	2013	13000	37802302445	4800	330000	0	214500
Botswana	2014	12000	39757059237	4500	330000	0	231000
Botswana	2015	11000	38937098204	4200	340000	0	261800
Botswana	2016	10000	0	3900	350000	0	290500
Brazil	2008	47000	70490575712	14000	570000	6252947	188100
Brazil	2009	46000	71996152713	15000	600000	3303385	210000
Brazil	2010	47000	89494141894	14000	630000	9171381	239400
Brazil	2011	47000	102931139719	14000	660000	9743606	264000
Brazil	2012	47000	96078378041	14000	690000	9258557	296700
Brazil	2013	48000	97593540495	14000	720000	0	338400
Brazil	2014	48000	101409210495	14000	750000	0	382500
Brazil	2015	48000	78039598216	14000	790000	0	450300
Brazil	2016	48000	0	14000	820000	0	492000
Columbia	2008	6800	32764064874	5000	110000	501306	13200
Columbia	2009	6900	32912683771	5900	110000	220541	15400
Columbia	2010	6900	38404702232	6600	110000	275591	33000
Columbia	2011	6800	42947240213	5800	110000	0	30800
Columbia	2012	6500	48117888515	4600	110000	176131	36300
Columbia	2013	6300	48296442417	4000	120000	30602	46800
Columbia	2014	6100	50667599133	3600	120000	0	54000
Columbia	2015	5800	37423638765	3200	120000	0	63600
Columbia	2016	5600	0	2800	120000	0	0
Dominican Republic	2008	3200	23367806801	5500	78000	15269296	10920
Dominican Republic	2009	3000	25035341801	4900	76000	0	12920
Dominican Republic	2010	2700	29965610197	4400	73000	0	16060
Dominican Republic	2011	2700	32662454505	4100	71000	0	19170
Dominican Republic	2012	2700	35153943987	3700	69000	20711558	21390
Dominican Republic	2013	2700	356898662	3400	68000	0	23120

Dominican Republic	2014	2700	37664217244	3100	67000	0	26130
Dominican Republic	2015	2600	39669252242	2700	66000	0	30360
Dominican Republic	2016	2500	0	2200	65000	0	29900
Gabon	2008	2700	25762783925	3100	47000	1488301	7050
Gabon	2009	2500	26339789445	3100	46000	2543529	9200
Gabon	2010	2500	21671412151	2900	45000	2356058	9900
Gabon	2011	2500	27408999726	2900	45000	3604203	11700
Gabon	2012	2400	23663051177	2600	44000	2003421	13640
Gabon	2013	2300	27498907252	2200	44000	0	18040
Gabon	2014	2100	24548532796	1800	44000	0	19800
Gabon	2015	2000	19794471527	1700	44000	0	24640
Gabon	2016	1700	0	1500	45000	0	28350
Iran, Islamic Rep.	2008	6600	29943993154	2700	58000	4462550	1160
Iran, Islamic Rep.	2009	6300	36757558237	3000	61000	4551488	1220
Iran, Islamic Rep.	2010	5800	4408524948	3300	62000	0	2480
Iran, Islamic Rep.	2011	5600	52469162232	3600	63000	0	2520
Iran, Islamic Rep.	2012	5500	51930359483	3800	64000	0	3840
Iran, Islamic Rep.	2013	5400	41372777441	3900	64000	0	4480
Iran, Islamic Rep.	2014	5300	38270589533	4000	65000	0	5850
Iran, Islamic Rep.	2015	5100	36598222838	4000	65000	0	7150
Iran, Islamic Rep.	2016	5000	0	4000	65000	0	9100
Malaysia	2008	10000	27257975556	8500	110000	291	9900
Malaysia	2009	9500	259071191	8500	110000	447059	11000
Malaysia	2010	8700	30201106452	8500	110000	56188	13200
Malaysia	2011	8200	361538638	8500	110000	2396941	14300
Malaysia	2012	7600	39127214373	8400	110000	1665338	15400
Malaysia	2013	7000	400	8500	100000	2105998	16000
Malaysia	2014	6500	43505859405	8300	100000	0	21000
Malaysia	2015	5800	3856203588	7800	99000	0	25740
Malaysia	2016	5700	0	7000	96000	0	35520

Mexico	2008	12000	55653465799	5200	170000	1617983	52700
Mexico	2009	12000	47764885047	5100	170000	1379026	56100
Mexico	2010	12000	53874476692	5400	180000	0	64800
Mexico	2011	12000	56512919162	5700	190000	12168390	72200
Mexico	2012	12000	58074840706	5700	190000	0	81700
Mexico	2013	12000	61787469815	5000	200000	0	90000
Mexico	2014	12000	59339844837	4900	200000	0	94000
Mexico	2015	12000	53481092964	4800	210000	0	115500
Mexico	2016	12000	0	4200	220000	0	132000
Namibia	2008	11000	39703713766	5700	170000	0	51000
Namibia	2009	12000	34096818147	4900	180000	120000000	59400
Namibia	2010	12000	49150411028	4800	180000	110000000	77400
Namibia	2011	11000	54415338972	4200	190000	0	96900
Namibia	2012	11000	52833319309	3800	200000	0	110000
Namibia	2013	11000	47403643795	3600	200000	0	116000
Namibia	2014	10000	44244143541	3700	210000	0	123900
Namibia	2015	10000	42307045216	4300	210000	0	132300
Namibia	2016	9600	0	4300	220000	0	140800
Papua New Guinea	2008	2800	3671631442	1700	35000	0	4550
Papua New Guinea	2009	2700	3895797768	1600	36000	40132667	5760
Papua New Guinea	2010	2700	4225284029	1700	37000	38821670	7030
Papua New Guinea	2011	2700	5675515326	1700	37000	34509487	8510
Papua New Guinea	2012	2700	761627761	1700	38000	29533509	11020
Papua New Guinea	2013	2700	9897123206	1500	39000	0	13650
Papua New Guinea	2014	2700	9755258656	1300	40000	0	16800
Papua New Guinea	2015	2800	7734963166	1200	41000	0	19680
Papua New Guinea	2016	2800	0	1100	42000	0	21840
Rwanda	2008	8500	4731350709	7700	180000	100000000	59400
Rwanda	2009	9200	5130129532	6700	180000	160000000	72000
Rwanda	2010	9800	5500867604	5600	180000	0	84600

Rwanda	2011	8800	5842114233	4600	190000	220000000	98800
Rwanda	2012	9200	6004236447	4000	190000	220000000	114000
Rwanda	2013	8000	567600488	3700	200000	0	130000
Rwanda	2014	7700	5930431056	3500	200000	0	136000
Rwanda	2015	7700	5665848825	3400	200000	0	148000
Rwanda	2016	7500	0	3300	210000	0	168000
Thailand	2008	15000	15147379322	27000	510000	30508991	163200
Thailand	2009	14000	15245145335	25000	500000	13986791	180000
Thailand	2010	13000	17205752988	23000	500000	35926668	205000
Thailand	2011	12000	195938433	21000	490000	46430392	220500
Thailand	2012	11000	20644031739	20000	480000	0	235200
Thailand	2013	9700	21300305772	19000	470000	0	249100
Thailand	2014	8700	21936612675	18000	460000	0	266800
Thailand	2015	7300	21713523195	16000	450000	0	274500
Thailand	2016	6400	0	16000	440000	0	303600
Venezuela, RB	2008	7100	49505768162	1900	85000	156014	27200
Venezuela, RB	2009	7100	5904493596	2000	90000	345384	32400
Venezuela, RB	2010	7000	61411194936	2000	95000	626411	38950
Venezuela, RB	2011	7000	520	1900	99000	133327	40590
Venezuela, RB	2012	7000	47419447582	2100	100000	702563	42000
Venezuela, RB	2013	6900	42987161149	2400	110000	817796	44000
Venezuela, RB	2014	6800	56950042522	2900	110000	0	42900
Venezuela, RB	2015	6600	97295147312	3300	110000	0	60500
Venezuela, RB	2016	6500	0	2500	120000	0	73200

Country (high income)	Year	Newly infected	Health expenditure	AIDS deaths	Living with HIV	INT finance	ART
Pakistan	2008	13000	2698818286	1000	42000	4476514	840
Pakistan	2009	14000	2532489896	1000	54000	8261902	1080
Pakistan	2010	14000	265686252	1300	65000	8163974	1950
Pakistan	2011	14000	2864483945	1900	75000	2181908	2250
Pakistan	2012	15000	2846501237	2600	86000	6992470	3440
Pakistan	2013	16000	3155068096	3300	97000	6361662	2910
Pakistan	2014	17000	3652147697	4100	110000	0	5500
Pakistan	2015	18000	3799237688	4800	120000	0	6000
Pakistan	2016	19000	0	5500	130000	0	9100
Senegal	2008	2500	470301365	1600	41000	19177943	8610
Senegal	2009	2000	4246641606	1500	41000	0	9840
Senegal	2010	1800	4013842343	1500	40000	0	11200
Senegal	2011	1600	4268439656	1700	40000	19809176	12000
Senegal	2012	1500	396913484	1800	39000	0	11310
Senegal	2013	1300	4074475539	2000	38000	0	12540
Senegal	2014	1400	4197709433	2100	37000	0	14430
Senegal	2015	1200	3607884461	2000	37000	0	16280
Senegal	2016	1100	0	1900	36000	0	18720

Lihtlitsents lõputöö reprodutseerimiseks ja lõputöö üldsusele kättesaadavaks tegemiseks

Mina, Kerstin-Gertrud Kärblane

(isikukood: 49612302721)

annan Tartu Ülikoolile tasuta loa (lihtlitsentsi) enda loodud teose,

The effectiveness of international organisations in the fight against HIV/AIDS,

mille juhendaja on Raul Toomla (PhD),

1. reprodutseerimiseks säilitamise ja üldsusele kättesaadavaks tegemise eesmärgil, sealhulgas digitaalarhiivi DSpace-is lisamise eesmärgil kuni autoriõiguse kehtivuse tähtaja lõppemiseni;
2. üldsusele kättesaadavaks tegemiseks ülikooli veebikeskkonna kaudu, sealhulgas digitaalarhiivi DSpace´i kaudu kuni autoriõiguse kehtivuse tähtaja lõppemiseni;
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Tartus 20.05.2018

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(*allkiri*)